

## DATA EVALUATION RECORD

CHEMICAL: Didecyl dimethyl ammonium chloride

FORMULATION: Bardac 22 (50%)

CITATION: Report: 48 Hour EC<sub>50</sub> and 96 Hour LC<sub>50</sub> of Calgon JJ-14 (Bardac 22) on Oyster Eggs and Straight-Hinge Larvae. Cannon Laboratories, Inc. for Calgon Corp., Dec. 19, 1974 (acc. # 249002).

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HED/EEB

DATE REVIEWED: February 2, 1983

TEST TYPE: Static acute aquatic toxicity  
Oyster eggs and straight-hingelarvae

REPORTED RESULTS:

Eggs 9-hr EC<sub>50</sub> = 19 (9.5-38) ppm

<u>Larvae</u>	<u>LC50 Values</u>
48h	10.5 (5.53-19.95) ppm ✓
96h	6.4 (2.46-16.64) ppm
144h	3 (2.37-11.48) ppm

REVIEWER'S CONCLUSIONS:

The study is scientifically sound and meets our guideline requirements for acute aquatic toxicity tests with oysters.

## Test Procedures

### Materials and Methods

Three female and five male adult oysters were induced to spawn in 28°C seawater. The sexes were separated after spawning commenced. Eggs and the SW medium were poured into a 1-liter cylinder and 3 one-ml subsamples were counted in a Sedgewick-Rafter counting chamber. Each subsample was multiplied by 1000 to give the number of eggs in the cylinder.

The eggs were poured into a 2800-ml Fernbach flask and sperm were added to initiate fertilization. Three one - ml subsamples were removed after 1 1/2 hr. to see if fertilization had succeeded.

The test material was added to a series of 2800-ml Fernbach flasks containing 1-liter of filtered (10 microns) seawater. Each concentration was run in duplicate and there were 2 negative controls. The test was conducted at 28°C. A sufficient volume of fertilized eggs was added to each flask to give a density of 30 eggs per ml. Three 1-ml subsamples were removed at 9, 48 and 96 hours from each test concentration and control. The percentage of eggs affected was noted and the percent mortality for straight-hinge larvae determined. Food was added at 48-hr intervals at a density of  $4 \times 10^5$  cells/ml.

### Statistical Analysis

Eggs were observed for abnormal development as compared to the control (expressed as % abnormal), and the larvae were observed for mortality. The EC<sub>50</sub> and LC<sub>50</sub> values were calculated with the Litchfield-Wilcoxon method.

### Results and Discussion

#### Egg Development at 9-Hours

Conc. ppm	# with abnormal cleavage #treated eggs	% abnormal cleavage
25.0	*107/192	**56
12.5	82/192	42
6.2	40/192	20
3.1	11/192	6
1.5	8/192	4
0.75	4/192	2
0.09	4/192	2
Control	6/192	3

\* Average of 6 observations

\*\* Rounded off.

9-hr EC<sub>50</sub> = 19 (9.5 - 38) ppm

#### Straight-Hinge Larvae

Conc. ppm.	48-h		72-h		96-h		120-h		144-h	
	A	B	A	B	A	B	A	B	A	B
25.0	132/192	69	146/192	76	155/192	81	167/192	87	176/192	92
12.5	111/192	58	125/192	65	138/192	72	148/192	77	159/192	83
6.0	65/192	34	75/192	39	83/192	43	94/192	49	109/192	57
3.1	31/192	16	52/192	27	65/192	34	79/192	41	92/192	48
1.5	21/192	11	31/192	16	40/192	21	46/192	24	57/192	30
0.75	17/192	9	27/192	14	33/192	17	42/192	22	54/192	28
0.09	6/192	3	10/192	5	15/192	8	19/192	10	25/192	13
Control	8/192	4	13/192	7	17/192	9	19/192	10	22/192	12

A = # dead treated larvae/# treated larvae

B = % mortality

Hr	LC50	95% Conf. limits (ppm)
48	10.5	(5.53 - 19.95)
72	9.40	(8.1 - 10.94)*
96	6.4	(2.46 - 16.64)
120	5.9	(5.13 - 6.85)*
144	3	(2.37 - 11.48)

\* Calculated by Stephan's program with moving average method.

#### Reviewer's Evaluation

##### Materials and Methods

The procedures are acceptable.

##### Statistics Analysis

Recalculation with Stephan's program (using Abbott's formula to correct for control mortality) indicates the reported results are reliable.

##### Results and Discussion

Bardac 22 is slightly toxic to oyster eggs and moderately toxic to straight-hinge larvae.

##### Conclusions

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